

Rational Exponents

1. The volume, V , of a soap bubble is related to its surface area, A . In cubic centimeters, this relationship is shown by the formula $V = 0.094A^{3/2}$. What is the surface area of a bubble with a volume of 5 cm^3 ?
2. The number of hours, H , that milk stays fresh is a function of the surrounding temperature, T . In degrees centigrade, this relationship is shown by the formula $H(T) = 180 \cdot 10^{(-.04T)}$. How many hours will newly pasteurized milk stay fresh when stored at 8°C ?
3. A fast ship's speed, S , in knots varies directly as the seventh root of the power, P , in horsepower being generated by the engine. This is expressed by the formula $S = 6.492P^{1/7}$. If a ship is traveling at a speed of 25 knots, about how much power is the engine generating?
4. A formula that the police use for finding the speed, S , in miles per hours that a car was going from the length, L , in feet of its skid marks is $S = \sqrt{5L}$. The *Guinness Book of Records* reports that in 1960, a Jaguar in England had the longest skid mark ever recorded: 950 ft.
 - a. What was the Jaguar's approximate speed?
 - b. About how far will a car travel if it skids from 50 mph to a stop?
5. Mike has \$500 he wants to save for a big trip in the summer after he graduates from high school. His goal is to find an investment vehicle that will allow his money to double to \$1,000 in 4 years. What compound annual interest rate, R , will make this happen? This can be expressed by the formula $A = P(1 + R)^T$, where P is the original principal, R is the annual interest rate, T is the number of years, and A is the total value of the investment.